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GEOGRAPHICAL RECORD.

AMERICA.

THE MAPPING OF THE UNITED STATES.—In co-operation with the Commissioner of Agriculture of North Carolina the topographic branch of the United States Geological Survey has made considerable progress during the past two years in mapping the eastern coastal plain of North Carolina. During the past season the survey of eight atlas sheets was completed—namely, Edenton, on Albemarle Sound, and Vanceboro, Ayden, Tarboro, Rocky Mount, Wilson, Spring Hope, and Kenly, at the head of Pamlico River and west thereof.

This is a most interesting region topographically because of the exceeding flatness of the slopes and the great fresh-water marshes with which the region is covered, from which rise the brushy bog lands known in this region as *pocosons*. The object of this survey has been to furnish a basis upon which the State Agricultural Commissioner, in co-operation with the Bureau of Soils of the United States Department of Agriculture, may make a careful map and study of the soils, with a view to the further development of truck farming and tobacco-growing, which have become such important industries in this region. The rivers, as the Tar, in the neighbourhood of Tarboro, flow in wide meanders through broad valleys, and are bordered alternately on one bank or the other by steep-cut banks twenty to thirty feet in height.

Above these low flood bottoms, which are at all times swampy and are often overflowed, the upland has gentle slopes, often not exceeding five feet to the mile. Upon the higher portions of these uplands occur the pocosons, their characteristics being unusual and of a kind best known and best shown on the northern edge of this region in the Dismal Swamp. In the Vanceboro area Big Pocoson, probably one of the largest in the region, covering an area of about 75 square miles, has an altitude a trifle over 40 feet near its centre, the country sloping thence to the outer margins, where the elevation averages twenty feet. The whole of this and the neighbouring pocosons is densely covered with a heavy growth of impenetrable wood and brush. So closely does this grow that it was impossible for the surveyors to enter without incurring great expense for cutting and for building corduroy roads over the swampy land. In spite of the forbidding nature of these pocosons,

however, they are rapidly being reclaimed. Railroads and county highways and lumber roads have in recent years been opened into and through some of them, and, by the aid of drainage, farming has encroached upon them until some have nearly disappeared through conversion to agricultural uses.

H. M. W.

Good progress was made in 1902 in the co-operative mapping of the State of Pennsylvania by the United States Geological Survey. During that season there were mapped four atlas sheets in the central-western portion of the State, where important coal interests are developing—in Clearfield, Indiana, and neighbouring counties; also a couple of sheets in the western portion of the State and one in the eastern. The latter, the Lancaster sheet, represents some interesting topographic features, and includes an area of well-cultivated farm lands, and a portion of the Susquehanna River, in which important water-power developments are now in progress. Thousands of dollars have been recently expended in surveys for canals to divert the waters of the Susquehanna. At least two great corporations are now engaged in construction, which must make Lancaster, Columbia, and York important industrial centres in the near future.

The development of new coal lands in Indiana and Clearfield counties is a matter of recent years, and of great importance. The area shown on the maps is on the crest of the Alleghenies, where the general surface elevations average nearly 2,000 feet. The summit of the Alleghenies in this region is a high tableland, slightly eroded, the stream bottoms being at altitudes of about 1,000 feet. The crests of the tableland average 1,500 to 2,000 feet. The whole surface of the country is densely covered with timber, so that, as viewed from above, it has much the aspect of a plain, the undulating mountain surfaces and stream valleys not being visible until more nearly approached.

One of the most effective sheets mapped by this Bureau in Pennsylvania is the Newcastle sheet, which is on the border of Ohio, immediately northwest of Pittsburg. Through the centre of it, flowing north and south, is Beaver River, in a valley averaging a mile in width, bordered by steep-cut banks about 100 feet in height, above which is a broad flood-plain at an average elevation of 900 feet, and of very level and uniform slope. In this flood-plain are built the great industrial seats of Beaver Falls, Elmwood City, and Newcastle. The southwestern portion is much like that surrounding Pittsburg—a rolling, hilly country of from 1,000 to

1,200 feet in altitude. The northwestern flattens out abruptly towards the more level region bordering Lake Erie. It has very gentle slopes and changes of elevation, varying only between 1,100 to 1,200 feet.

H. M. W.

During 1902 the United States Geological Survey completed the mapping, in co-operation with the State of New York, of two of the most important resort areas in the Adirondacks. These include an area of about 500 square miles, represented on the Saranac Lake and Long Lake sheets. In the progress of this survey there had previously been completed in the Adirondacks 20 atlas sheets, covering about 5,000 square miles, and there remain unmapped not much over 1,000 square miles in the northwestern portion of the region.

The sheets above named represent some of the most interesting features of the lake region. The Saranac Lake sheet includes the Rainbow Lake and Osgood and Jones Ponds, within the Rockefeller Preserve; also Clear Lake, McCaulley, Colby, and McKenzie Ponds; also the whole of lower Saranac Lake, a portion of middle Saranac Lake, Lonesome Pond, and the flow above it known as Miller Pond. Near the centre of the sheet is Saranac Lake village. There are some agreeable contrasts in topography to be observed on this sheet. Near the southwestern corner are the high mountains bordering on Mts. Marcy, Morris, and White Face. Mt. McKenzie, the highest peak on the sheet, has an altitude of 3,872 feet. In the northwestern portion of the sheet are great level plains, true swamps, and covered mostly with blue berries, one of the best-known blueberry plains in the State of New York, extending from a few miles above Saranac to Bloomingdale Station, through which the Chateaugay railroad passes with a tangent about four miles in length. The lower Saranac River from the village to Bloomingdale wanders through another swampy blueberry plain. To the west the New York Central railroad runs through a sloping plain of considerable extent, reaching from Paul Smith's Station to Saranac Junction. Interesting features in the area are Rainbow Lake, Clear Pond, and their borders, the marginal slopes of which consist of a series of sand hills and pot-holes of rather unique topographic aspect.

The Long Lake sheet depicts the larger portion of the Raquette Pond and part of Big Tupper Lake, all of Big Simon and Follensby Ponds, also Catlin Lake, and the entire northern half of Long Lake. These lakes and ponds are in a country much more moun-

tainous and broken than that about Saranac, and the ponds are at much higher elevation, with precipitous shores rising to the higher mountains. Among the more important of these is Mt. Morris, reaching 3,163 feet. The northern portion of this area is a great flooded plain, out of which numerous low hills rise and through which the Raquette River flows into Big Tupper Lake, near Tupper Lake village. This river was one of the old thoroughfares of travel from the northern to the southern portions of the Adirondacks by boat, and in the centre of the sheet are the celebrated Raquette Falls—a most picturesque group of cascades.

H. M. W.

WATER SUPPLY AND IRRIGATION PAPERS.—In No. 76 of this series of reports published by the United States Geological Survey, Mr. H. A. Pressey says that the development of water power in this country has never made such strides as during the past ten years. The last census shows that the increase in the utilization of water power from 1890 to 1900 was about 30 per cent., or 472,361 horse power. In Maine the developed power increased 60 per cent. The paper, which is entitled “Observations on the Flow of Rivers in the Vicinity of New York City,” is largely devoted to the methods of collecting data with regard to the flow of rivers, including the results of observations made on Catskill, Esopus, and Rondout creeks, and the Wallkill and Housatonic Rivers.

No. 68, by Mr. L. H. Taylor, is entitled, “Water Storage in the Truckee Basin, California-Nevada.” It relates to surveys made by Mr. Taylor to learn how far the water of Truckee River may be used to develop the arid lands of Nevada. He shows that, by means of dams and other hydraulic works, a large amount of water which now runs to waste may be conducted upon vacant public land. Hydrographer Newell is of the opinion that the construction of these works would do much to increase the cultivated area and population of Nevada.

THE MARYLAND GEOLOGICAL SURVEY.—This Survey has now issued three volumes dealing with the physical features of the several counties of Maryland. Vol. I (Allegany Co.) was published in 1900, and Vols. II (Cecil Co.) and III (Garrett Co.) were issued last year. Each volume embraced a description of the surface features, geology, mineral resources, soils, climate, hydrography, forests, and other characteristics of the region treated. The papers are written by members of the State Survey or other specialists, including a number from the Washington Departments.

There are many fine photographs, most of them taken by the authors of papers during their field work, and each volume is accompanied by large-scale topographical, geological, and soil maps. These are detailed geological and geographical studies of educational and economic value to the citizens and to all who may contemplate settling or investing in these counties. A considerable number of economic deposits not yet utilized are mentioned.

The Survey has also issued Vol. IV of the *General Reports*. The volume contains an account of the results reached concerning the various changes in Western Maryland during geologic time; the latest information concerning the highways of the State and the efforts to improve their condition; and an exhaustive discussion of the extensive clay deposits of Maryland.

THE CENTRAL OHIO NATURAL GAS FIELDS.—Four reservoirs of natural gas have thus far been discovered in central Ohio. The Thurston and Newark fields were long ago exhausted, and the fields from which gas is now derived are known as the Sugar Grove and Homer. The most important is Sugar Grove, which occupies parts of Fairfield and Hocking counties. As developed in 1902, its length is 16 miles, and its maximum width 11 miles. The Homer Field, as developed in 1902, includes parts of Licking and Knox counties. Geographically and geologically they are closely related. The gas rock lies near the base of the Clinton sandstone formation, and is separated from the underlying Medina by a few feet of dark slate. The gas rock is a light-coloured sandstone of moderate grain, drills hard, and the thickness of the stratum is not definitely known, the maximum reported being 34 feet, and the average, perhaps, one-half of that. In 1902 at least 60,000,000 cubic feet of gas were taken, on an average, from the Sugar Grove field every twenty-four hours, supplying many towns in northern and northwestern Ohio, including Toledo, Columbus, Newark, Zanesville, and other towns in central Ohio; Dayton and other cities in western Ohio, and a number of other towns. This territory has passed its zenith, and, unless extensions are found, its production may rapidly decrease. The Homer field was opened in 1900, and has developed two great wells flowing about 9,000,000 and 11,000,000 cubic feet a day, besides a number of others, ranging from 4,000,000 to 6,000,000. As yet the pressure is high and the gas is supplementing the supply of fuel from Sugar Grove, and may do much more. (*The American Geologist*, April, 1903.)

PORTO RICO.—The Second Annual Report of Governor Hunt, of Porto Rico, issued from the Government Printing Office, Washington, includes an excellent summary of the resources and industries of the island. Although nearly 1,000,000 persons live on this small island, whose area is about 2,347,520 acres, only about 20 per cent. of the land is cultivated, 51 per cent. being devoted to pastures, 7 per cent. waste land, and 22 per cent. is in roads, streams, towns, and forests. Of the cultivated lands, 61,556 acres are in sugar cane, 122,358 in coffee, 4,222 in tobacco, 93,508 in beans, rice, and corn, and 17,176 in fruits. Sixty-three per cent. of the population is engaged in agriculture. There are still about 100,000 acres of public lands, some of which are valuable for agriculture and timber, and others will be available for the extension of the larger cities. The prices of agricultural land, as might be expected in so densely-populated a country, are high. The best sugar lands are valued at \$150 an acre; tobacco lands from \$60 to \$75 an acre; fruit lands from \$40 to \$50 an acre; pasture lands from \$15 to \$20 an acre; and hill lands, suitable for coffee, from \$10 to \$15 an acre. It is expected that within three years the island will have a complete system of well-built principal highways, and then short lateral roads will be built at comparatively small expense.

GEOGRAPHICAL BIBLIOGRAPHY OF CHILE.—An *Ensayo de una Bibliografía Histórica i Jeográfica de Chile*, published in Santiago last year, will be very helpful in studying the history and geography of that country. The authors are Nicolas Anrique R., and L. Ignacio Silva A., and their work has been received with special favour by their countrymen. The Geographical Bibliography is introduced by a chapter on the physical geography of the Republic, which is of much value as an authoritative treatment of the subject; it occupies 49 pages. The bibliography includes 1,565 geographical titles, arranged under 17 subject-heads, with notes under many of the titles giving additional information. The systematic arrangement, according to subject and an index of authors, makes it easy to find any work included in the list.

AFRICA.

THE OUTLET OF VICTORIA NYANZA.—Mr. R. B. Buckley says in *The Geographical Journal* (April, 1903) that though many rivers and streams flow into the Victoria Nyanza the only outlet is the Nile at Ripon Falls, on the north central coast. The catchment basin of the lake is about 95,000 to 100,000 square miles, and the rainfall

is assumed to be about 30 inches a year; but only a small part of this water passes over Ripon Falls to form the Nile. The falls may possibly draw off from the lake sufficient water to lower it 9 inches or a foot in a year, but the evaporation and absorption must be at least 6 or 8 times as much as this. Ripon Falls might better be described as rapids. There is a rocky barrier of hornblende-schist, like an embankment, across the channel where the Nile issues from the lake. This barrier is perhaps 10 to 12 feet above the ordinary lake level, but it is broken in three places by gaps, through which the water rushes. The barrier from shore to shore is perhaps 1,200 feet long, and the three gaps in it are probably less than 300 feet, but they have never been measured. The water of the lake, above the barrier, is about 14 to 15 feet above that in the river below. The depth of water, as it rushes through the gaps, probably does not average more than 6 to 8 feet. Mr. Willcocks gives the minimum discharge of Ripon Falls as 25,000 cubic feet per second, and the maximum as 30,000 cubic feet; but even 30,000 cubic feet per second would draw only one twenty-fifth part of an inch off the entire surface of the lake in one day, or about one and one-fourth inches in a month.

GREAT BRITAIN'S TREATY WITH ABYSSINIA.—The treaty between Great Britain and Abyssinia, signed at Adis Ababa on May 15th, 1902, fixing the boundary between Abyssinia and the Sudan, includes two provisions which will be of great value to Egypt. In the first place, King Menelek authorises Great Britain to extend a part of the Cape to Cairo Railroad through the western region of Abyssinia; in other words, the railroad will be built from Khartum up the valley of the Blue Nile into Abyssinia, and then south across the southwest corner of that kingdom, to or near the west coast of Lake Rudolf, and then southwest to Uganda. In this way the great region of swamp and sudd, supposed to be about 12,000 square miles in extent along the upper part of the White Nile, will be avoided. It was found that it would be very difficult, if not impossible, to build the railroad through this region. It will be a great advantage to construct the road through the more healthful country to the west, which has promise of commercial development.

King Menelek also agreed not to construct or permit the construction of any works on the Blue Nile, Lake Tsana, or the Sobat River that would tend to hinder or diminish the flow of their waters to the Nile, unless with the consent of the British and Indian Governments. Egypt thus secures the full use of the rich, muddy

waters of the Blue Nile, which, to a greater or less extent, might otherwise be retained for irrigation along the upper valley of the river, where there is an important amount of arable land.

EXPLORATION OF LAKE CHAD.—*La Géographie* (March, 1903) says that since the overthrow of Rabah and the establishment of French influence in the country of Kanem, on the northeast side of the lake, Lieut.-Col. Destenave and his officers have been engaged in scientific explorations of Lake Chad and the region of the Shari River. The form of the lake, as mapped, has been considerably modified by their surveys. The islands in the west have been accurately mapped. Most of the islands, however, are towards the eastern shores, and form two great groups—the Kuri archipelago, in the large southeastern extension of the lake, where the Bahr el Ghazal flows into the Chad; and the Buduma archipelago, which skirts the coast of Kanem north of $13^{\circ} 30'$ N. lat. About 19,000 persons originating in Kanem live on the Kuri islands. They are Mohammedans, and went to the islands to escape the attacks of nomads. They live by cattle and millet raising and the fisheries. Twenty-six of the Buduma islands have a population of about 17,000 souls. They say they came from Sokoto three centuries ago. They do not intermarry with their neighbours, and each island seems to be in all respects independent of the others. The inhabitants live on milk and millet, but do not fish. The French have taken possession of all these eastern islands, most of which are low and sandy. The islands have about 80,000 head of cattle.

NACHTIGAL'S JOURNEY TO WADAI.—Le Comité de l'Afrique Française has begun the publication of a complete translation into French of Nachtigal's account of his explorations in Wadai. This famous German explorer spent six months of 1873 in the study of that region, till then almost wholly unknown, which forms the extreme eastern part of the Central Sudan. These explorations concluded Nachtigal's great work of seven years in the Sudan. French colonial expansion has now reached the border of Wadai, and for this reason it is intended to place before the French public the most complete treatment of that country in all its aspects that has yet been published. The first instalment is in *Supplément 3 (Renseignements Coloniaux et Documents)*, which accompanies the March number of the *Bulletin Mensuel*. The translation will fill several supplements.

THE LIVINGSTONE MEMORIAL.—Mr. Alfred Sharpe has informed *The Geographical Journal* (April, 1903) of the completion of the monument erected to the memory of Dr. Livingstone on the site of the great explorer's death. The work has been excellently carried out by Mr. Codrington. It is made of well-burned bricks, thickly coated with cement. There are no flat surfaces on which rain can lodge, so that it may be expected to last for many years. The monument bears a tablet, on which is recorded the fact that Livingstone died on that spot. The sum of money remaining after completing the monument will be expended in the erection of a native hospital, to be known as the "Livingstone Memorial Hospital," at Fort Jameson, the European settlement nearest to the spot where the explorer breathed his last.

FISHERIES OF THE CAPE OF GOOD HOPE.—For a number of years the Government of Cape Colony has been studying the fisheries around the coasts, with a view to securing larger supplies for the home market, the present yield not keeping pace with the demand. A report on the progress of this work, made annually by the Marine Biologist, and published by the Agricultural Department, is devoted largely to the researches of a small Government steamer, which hunts for new fishing areas and makes physical observations as to temperature, currents, the nature of the sea floor, and other facts which affect sea life. In 1898 a large deep-sea fishing area was discovered near Mossel Bay, over a part of the Agulhas Banks. Further studies since that time have confirmed the first impression that in extent of fishing grounds and the quantity and quality of the fish this area of about 500 square miles is likely to become the most important source of the fish supply for the colony. Mossel Bay is on the south coast, about midway between Cape Town and Port Elizabeth, or 200 miles from the nearest market. In that warm region, with ice at about \$10 a ton, the expense of getting fish to market is important; but, by returning to the sea all the fish caught, excepting soles, which bring the best price, the new fishing grounds are now being turned to good account.

POPULATION OF MADAGASCAR IN 1902.—The population of Madagascar (Census of 1902) is 2,501,691 natives and 8,906 Europeans and other foreigners. The largest town is the capital, Tananarive, with a population of 51,620 natives and 906 foreigners. The largest foreign population is at or near the ports, the Province

of Tamatave having 2,175 foreigners; the Territory of Diego Suarez, 1,655; and the Province of Majunga, 1,213.

CLIMATE OF GERMAN EAST AFRICA.—One happy result of the growth of European “spheres of influence” in Africa is the increase in our scientific knowledge of the continent which is now less and less properly called dark. Among the notable scientific advances which are being made in equatorial Africa there is perhaps none which interests a larger body of persons than the progress in an understanding of the climatic conditions, for the future development of these African provinces depends very largely upon the possibility of their occupation, at least to some slight degree, by foreigners, and upon the kinds of crops which may successfully be grown there. The contributions to African climatology in English, French, and German are increasing rapidly in number, and all of them are of great value, and of general interest.

One of the latest of these studies was presented to the German Colonial Congress held in Berlin in October last (H. Maurer: “Das Klima von Deutsch-Ostafrika,” *Meteorologische Zeitschrift*, XIX, 1902, 543). German East Africa is one of the most interesting portions of Africa, in that it lies between the equatorial belt of calms, in the northwest, and the southeast trade belt of the southern hemisphere, with the district of the northeast monsoons in the northeast. During the months from June to October the winds blowing towards the barometric equator to the north are southeast and south. These winds, coming from higher latitudes, are dry, except where they are forced to rise over mountains, and this is, therefore, the dry season over most of the district. In the five months June to October there is very little rainfall, months without any precipitation being of fairly frequent occurrence. The diurnal range of temperature is naturally large under the clear skies of this season; even on the coast it has reached 32° at Lindi. Dew is of almost daily occurrence, and supplies vegetation with needed moisture. Where the southeast trade is forced to ascend mountains, as in the case of the mountains on the south and east, near the ocean, there is rainfall, which is of great importance to the plantations in Usambara. During the summer months the northeast monsoon prevails over German East Africa, and in the intervening periods there are, as elsewhere, light variable winds and rains, which in some places last for two months (December–February). In the northeast of the colony, however, the northeast monsoon is very strongly developed, and brings a well-marked dry

season in Usambara and in the Kilimanjaro district. Here, then, are two rainy and two dry seasons, the first rainy season coming in November, and the second in March-May.

As regards temperature, the greater portion of the colony has its hottest weather before the summer rains, for during the latter season the cloudiness causes a reduction in the temperature. This type of temperature distribution is known as the *Indian* type. In the northeastern portions, however, where the rains stop in summer, the maximum temperature comes in February, about two months after the solstice, which gives the *European* type. In the northwestern corner, where the distance from the equator is only 1° , we have the *equatorial* type, mean annual range only 2° - 3° ; and a fairly uniform distribution of rainfall through the year; thunderstorms frequent and severe. The Victoria Nyanza has its own system of land and lake breezes. Maximum temperatures of over 100° have not been recorded. The hot nights are more oppressive than the hot days. During the hottest season on the northern coast, in December, 1897, at Dar-es-Salam, there were twenty-six consecutive days and nights during which the thermometer did not fall below 79° . These hot northeast monsoon nights are sleepless nights for the European, and they come at a time when malaria is most common. On the coast the mean temperature of the warmest month is 82.4° ; that of the coldest between 72° and 75° . Even on the plateaux the temperatures are not much lower, but the mountains give some relief. Usambara (about 1,200 metres) has a mean annual of 64.4° , as against 77° and 79° on the coast.

There is great variation in the rainfall from year to year. The year September, 1896-August, 1897, gave 102 inches at Tanga, and the following year gave only 23 inches. Such fluctuations cause droughts and famines in the dry years and floods in the years of heavy precipitation. A severe famine occurred in 1898 in consequence of deficient rainfall. This extraordinary uncertainty as to the annual rainfall is a very unfortunate thing for the colony, and it happens that the infancy of German East Africa has come at a particularly dry time, as is shown by the fall in the levels of several lakes in different parts of the district. While this dry period may now be at an end, the hope for the future is chiefly to be centred on those portions of the colony which have a large mean annual rainfall and which show the least variation in the rainfall from year to year. Of these more favourably situated districts Konde-land, north of Lake Nyassa, seems to be the most promising.

R. DEC. W.

POLAR REGIONS.

ICE CONDITIONS IN THE ARCTIC SEAS IN 1902.—The Danish Meteorological Institute has just published six charts of the North Polar regions showing the state of the ice in those waters for each month of 1902, from March to August inclusive. Various symbols are used to denote land floe, large ice fields, tight pack ice, open ice, bay ice and brash, and icebergs. In the larger part of the Polar domain the ice conditions, of course, are marked "unknown." The charts are accompanied by a summary of all the information received as to the ice conditions for that year. The Danish Meteorological Institute undertook the publication of this interesting annual report upon the invitation of the Seventh International Congress. The information is obtained from shipmasters, private persons, and meteorological and hydrographic establishments. It is greatly desired to increase the quantity of data, and the co-operation of every scientific man and captain crossing the Arctic seas is solicited. The charts and letterpress are bound together in convenient form for reference.

SEARCHING FOR BARON TOLL.—The hopes that Baron Toll and his zoologist, Birula, who started in the summer of 1902 respectively for Bennett Island and New Siberia Island, would meet again in the fall at Kotelnoi and travel together over the ice to the Lena delta have been disappointed. Birula returned alone, bringing no news of Baron Toll except that on his way north he reached Cape Visokiy (High Cape) on July 10th, 1902, and started again for Bennett Island. It now seems probable that if all went well with the explorer he spent last winter on Bennett Island. A relief expedition, consisting of six dog sledges, has started for New Siberia with supplies for Baron Toll; and Lieut. Kolchak has also left Siberia for the same purpose, with the intention of travelling over the ice, if necessary, to Bennett Island. The latter expedition was sent out by the Imperial Academy of Sciences at St. Petersburg. With two expeditions in the field not many months should elapse before news comes of the fortunes of Baron Toll.

NAVIGATION IN THE KARA SEA.—Mr. A. J. Varnek, in the *Izvestiya* of the Imperial Russian Geographical Society (No. 3, 1902), says that in many instances vessels traverse the Kara Sea and enter the Ob and Yenisei mouths without meeting ice; at other times ice blocks the way entirely. As far back as the sixteenth and seventeenth centuries Russian merchant vessels passed into the Kara Sea

from Archangelsk and Kola, sometimes reaching the mouths of the Ob and Yenisei. These daring navigators left hardly any records, and the sea route to the Ob and Yenisei was entirely forgotten at a later period; in fact, the Kara Sea was long thought to be impassable. It was only about the middle of the last century that the Kara Sea began to be revisited. Almost yearly since 1871 trading vessels have entered the Kara Sea, and others have doubled the north end of Novaya Zemlia.

The writer says that the conditions of navigation around the north end of Novaya Zemlia are not worse than through the straits south of it, and, perhaps when the distribution of ice on the northern route is better known it will prove to be the preferable highway. There is less ice in the northern than in the southern part of the sea. The conditions for forming ice in the south are more favourable than in the north. The mean winter temperature near the shores of the Arctic Ocean is lower than in the more northern part of these waters. [This fact is also recorded by Nansen.] The influence of the cold continental climate is particularly great in the Kara Sea, surrounded as it is on three sides by land and open to oceanic influences only on the north. The Kara Sea may be successfully navigated only by going north when the ice is in the south and *vice versa*; in other words, when a vessel encounters ice in Yugor Shar it ought at once to proceed to Kara Strait, and, if it fails there, it should go farther north to Matotchkin Shar, or even around the north end of Novaya Zemlia. The article is accompanied by four maps showing the distribution of ice in the Kara and White seas and adjoining parts of the Arctic Ocean from March to September, 1901.

THE ZIEGLER POLAR EXPEDITION.—Mr. Ziegler, who intends to make another attempt to reach the North Pole via Franz Josef Land, invited the National Geographic Society of Washington to designate some one to represent the Society with a view to giving authoritative endorsement to any determinations which may be made of latitude.

The Society selected Mr. William J. Peters, one of the most experienced topographers of the United States Geological Survey. Mr. Peters will have charge of the scientific work of the expedition. This is expected to include pendulum and magnetic observations, the collection of all geographic data and special collections of natural history, etc. Mr. Peters is especially well qualified for this purpose. He has spent twenty years in charge of exploring

and expeditionary parties for the Government, all in the more remote and unexplored portions of the West. For the last four or five years he has been in charge of the topographic surveys of that bureau in Alaska, and has had wide experience with Arctic conditions. Mr. Peters is also one of the most thoroughly-equipped geodesists in the service of the Government, and any determinations which he may make of geographic positions will carry with them an authority which has rarely been possessed by similar work.

H. M. W.

THE BRITISH ANTARCTIC EXPEDITION.—The steamer *Morning*, the relief ship of the British Antarctic expedition, returned to Lyttelton, New Zealand, on March 25th, with gratifying news of the work of the *Discovery* expedition during the past year. The *Discovery* entered the Antarctic pack in January, 1902, in lat. 67° , reached the north coast of Victoria Land in safety, visited Cape Adare, Wood Bay, and an excellent harbour in lat. $76^{\circ} 30'$, leaving a record of the voyage at Cape Crozier on January 22d. The steamer then pushed beyond Mounts Terror and Erebus, following the ice barrier eastward, and in long. 165° it was found to turn northward, the water becoming shallow. From the edge of the barrier high snow slopes rose to heavily-glaciated land, with here and there bare and precipitous peaks. The coast-line was followed to lat. 76° , long. $152^{\circ} 30'$, or about 150 miles beyond the furthest point previously reached in this direction.

Returning westward, the ship put into an inlet in the barrier in long. 174° , and a sledge party examined the land as far as $78^{\circ} 50'$ S. Excellent winter quarters were found near Mounts Erebus and Terror, where the ship was frozen in on March 24th; and though the weather was stormy and severe, the expedition passed a comfortable winter. The lowest temperature recorded was 62° below zero. Sledging began on September 2d, one party making a difficult journey to Mount Terror; while Commander Scott, Dr. Wilson, and Lieut. Shackleton travelled south, reaching land in lat. $82^{\circ} 17'$ S., long. 163° W., thus attaining the furthest south ever reached by man. The conditions of travel were most trying. All the dogs died, and the three men dragged the sledges back to the ship, Lieut. Shackleton nearly losing his life through exposure and coming home invalided on the *Morning*. Victoria Land was found to be traversed by ranges of high mountains, which in 82° reached a height of 10,000 to 12,000 feet. Foothills resembling the Admiralty Range were found in long. 160° , and after ascending a

glacier an unbroken level plain was discovered at an altitude of 9,000 feet. The coast-line was seen stretching away nearly due south to at least $83^{\circ} 20'$ S.—about 70 miles further south than the furthest point attained.

Capt. Scott travelled 292.1 statute miles nearer to the South Pole than did Ross, and surpassed Borchgrevink's record by 238.05 miles; but when he turned back to his ship he was still 532.45 miles from the Pole. Nansen's farthest was 261, and the Duke of the Abruzzi's 239 miles from the North Pole. Many other comparisons might be given to indicate the enormous amount of work that must yet be done before our knowledge of the Antarctic is commensurate with that which we have gained of the Arctic regions.

Whether or not Victoria Land proves to be of continental dimensions, the discoveries of the expedition show that it is one of the larger islands of the world. The known north and south extent of the east coast is more than two-thirds of the length of Greenland, which now ranks first among the great islands. The results of the first year's work were large, and considerable additions may be made in the second year.

ASIA.

SEISMIC FREQUENCY AT MANILA, TOKIO, AND AGAÑA.—Observations taken in the period 1892–1897 give an average of 13 earthquake days a year at the City of Agaña, Guam. The number at Manila during the same period was an annual average of 12.4 earthquake days. The statistics for Tokio show an average of 129 earthquakes a year, but they evidently include many seismic movements that are registered only by very sensitive apparatus. In the period 1876–1891, in a total of 1,168 seismic movements registered at Tokio on such instruments, only 540 (34 a year) were so strong that their direction and intensity could be determined. The number of earthquake days at Tokio when the movement is plainly perceptible is, on an average, about 32 a year.

AMERICAN GEOLOGISTS TO VISIT ASIA.—Professors Raphael Pumpelly, W. M. Davis, and Mr. Ellsworth Huntington will visit western Asia this summer, to be gone several months, and perhaps the remainder of the year. They will cross the Caspian Sea from Baku, take the railroad to Merv and Samarkand, and return, probably, across the plain to the northwest, past the Aral Sea to Orenburg, in southeastern Russia. Professor Pumpelly has already travelled extensively in Asia. In 1861–3 he made scientific explora-

tions for the Japanese Government; in 1863-4 he conducted a private geological expedition through central, western, and northern China and Mongolia, and explored the northern coalfields for the Chinese Government; and in 1864-5 he made a journey of exploration across the Gobi desert and returned to Europe through Siberia. Professor Pumpelly, who was in London early in April, said of the proposed trip:

There have been great physical geographical changes operating through many thousands of years toward rendering central Asia more or less a desert country. These changes have produced gradual depopulation of countries that were once largely peopled with different degrees of civilization, dating back several thousand years. The object of the trip is to see whether the region offers a promising field for the study of the relation between measurable physical geographical changes and economic social and ethnographic changes, and for archæological research in connection therewith. The journey is taken under the auspices of the Carnegie Institute for Original Research at Washington.

THE CLIMATE OF BAGUIO, ISLAND OF LUZON.—Where Europeans are called upon to live in moist tropical climates they find it highly desirable, if not absolutely necessary, to seek some relief from the continued high temperatures which prevail at sea-level by going, when possible, for part or all of the year, to some plateau or mountain station for recuperation. By so doing, continuous residence in such tropical climates is made more comfortable, and there is likelihood of escape, or of recovery, from some tropical diseases. Thus tropical mountain stations have become of considerable importance as resorts for Europeans. As Americans are now concerned with a tropical insular climate, in the Philippines, attention has naturally been directed to the possible development of a health resort in the mountains of those islands, and the plateau of Benguet, in the northwestern part of the island of Luzon, has been generally spoken of as the most likely place for such a resort. Exaggerated statements, not founded on meteorological facts, have been made regarding the use of this plateau as a means of solving the problem of acclimatization of the white race in the Philippines (see BULLETIN, XXXIII, 1901, 50-51). Fortunately, the Philippine Weather Service has established a meteorological station at Baguio, on the plateau of Benguet, so that definite conclusions may soon be drawn regarding the climatic conditions, although as yet but one year's records have been discussed ("The Climate of Baguio (Benguet)," by Rev. Father José Algué, S.J., Report of the Director of the Philippine Weather Bureau, 1901-2, Part First, 4to, Manila, 1902).

Baguio is really in a valley, surrounded by low hills, which form

a chain except on the northeast, where there is a ravine through which the valley is drained. The hills range in height from 60 to 150 ft. above the level of the valley floor, and the altitude of the station is 4,777 ft. The annual march of temperature is similar to that at Manila. February is the coldest month, and April the warmest. A second minimum occurs in August, and is probably due to the heavy rainfall of that month. The difference in the mean monthly temperatures at Manila and at Baguio ranges between 12.4° and 16.2° , as is seen in the following table:

	JAN.	FEB.	MAR.	APR.	MAY.	JUNE.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.
Manila.....	77.0°	77.7°	80.4°	82.9°	83.3°	82.0°	80.8°	80.8°	80.4°	80.8°	79.0°	77.4°
Baguio.....	63.5°	62.1°	66.0°	70.5°	68.3°	67.2°	66.5°	64.6°	67.0°	67.6°	66.0°	64.3°
Difference.....	13.6°	15.6°	13.6°	12.4°	15.0°	14.8°	14.3°	16.2°	13.4°	12.8°	13.0°	13.1°

The highest monthly temperature at Baguio is below the mean temperature of the coldest month at Manila. The mean daily temperature range is 18.8° in April (maximum), and 7.5° in June (minimum).

The mean monthly relative humidities are as follows:

JAN.	FEB.	MAR.	APR.	MAY.	JUNE.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.
76%	79%	76%	74%	86%	90%	89%	93%	90%	83%	82%	84%

Baguio has a good deal of fog. The annual variation in the number of foggy days is directly proportional to the humidity. Except during July, August, and September, the mornings are free from fog. As a whole the mornings have more fog than the evenings. There is less cloud and rainfall at Baguio than at stations near the eastern (windward) coasts in November–February. The following table shows the mean monthly cloudiness (0–10):

JAN.	FEB.	MAR.	APR.	MAY.	JUNE.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.
3.6	5.1	4.6	3.8	6.8	7.4	7.0	8.9	7.3	5.0	5.3	5.7

Baguio has its dry season in January–April, as will be seen in the table of monthly rainfalls following:

JAN.	FEB.	MAR.	APR.	MAY.	JUNE.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.
0.6	0.57	1.46	0.32	4.02	12.55	15.43	37.03	11.90	4.95	2.52	5.47

Annual Rainfall: 96.29 inches.

It is hardly worth while to enter into a discussion of the climate of Baguio on the basis of but one year's record. But it may be noted that this station has considerably lower mean monthly tem-

peratures than Manila, and, therefore, does provide some relief from the sea-level conditions. The maximum temperatures thus far recorded at Baguio are also much lower than at Manila. Baguio appears to have less cloud than Manila, but is most cloudy during the months when it is most needed as a health resort. The former station also appears to have a large number of foggy days, and more rainy days than Manila.

R. C. DEC. W.

GENERAL.

THE EFFECT OF CLIMATE ON RACIAL CHARACTERISTICS —In an important ethnological article on the probable character of the American race of the future ("What Shall It Be?," *Century Magazine*, March, 1903), Mr. Gustave Michaud seeks to determine the effects which the intermingling of the different European races will have in producing an American type of future generations. The three main sub-races in the Caucasian are the Baltic, the Alpine, and the Mediterranean. Of these the Baltic, which is to be found in its purest state in Scandinavia and in Scotland, occupies the British Isles, and the plain of northern Germany, and, in a more or less mixed condition, many portions of France, central Europe, and Russia. It is believed probable that this Baltic race is the result of natural selection exercised by the colder climate of northern Europe over the members of the primitive Mediterranean race who had migrated northward. Such an hypothesis serves to explain very satisfactorily many of the mental and physical characteristics of the present Baltic race. The result of living in a more rigorous climate was that those individuals perished who did not prepare for or were unable to withstand the severe winters, while the more thoughtful, the more energetic, the more ingenious, were able to survive. Thus, the posterity of the less fit relatively decreased, while that of the more fit increased, and the result was a new type, differing much from the old, and adapted for living in more rigorous climatic conditions.

R. DEC. W.

THE PRACTICAL SIDE OF GEOGRAPHY.—Professor W. M. Davis says, in his paper on "The Progress of Geography in the Schools" (*Yearbook of the National Society for the Scientific Study of Education*, Part II), that the practical side of geography is best taught in a well-developed course of commercial geography placed in the later years of the high school, after earlier courses on general geography in the grades and a course on elementary physiography, either in the

grades or in an early high school year. Here, if anywhere, it is important that the principles of systematic ontography, developed as they should be by collegiate and university study, ought to find application.

THE JOURNAL OF GEOGRAPHY.—The second year of this interesting and helpful publication begins with its removal to Chicago, where it will be published hereafter for the editors by Rand, McNally & Co. Professor Dodge remains in charge of the literary features, while the business management devolves upon Professor Lehnerts. The January number is filled with practical suggestions for geography teachers. Mr. Andrews' article on Australia shows how geographic problems may be studied on good maps, and how maps may be used to stimulate imagination and reflection. The mangrove tree is presented as a land-making plant. The influence of the glacial period upon the economic development of our country is a fascinating topic that may be so used in the classroom as invariably to impress upon the pupil's mind the relation of geographic environment to human progress. There are many other articles and notes, economic geography being particularly well represented. The *Journal of Geography*, in devoting itself to the interests of pupils of geography in the elementary, secondary, and normal schools, occupies a field of special usefulness.

NEW MAPS.

THE UNITED STATES.—Geologic Atlas of the United States.

No. 72. Charleston, W. Va. Folio. Area 938 square miles, extending from lat. 38° to 38° 30' and from long. 81° 30' to 82°. This quadrangle lies in the heart of the Appalachian coal basin, and its topography is of the type which characterizes the basins where the rocks are comparatively soft and undisturbed.

No. 73. Coos Bay Folio. Oregon. Area, 640 square miles, between parallels 43° and 43° 30' N. lat. and 124° W. long. and the Pacific Ocean. Among the foot hills at the western base of the Coast Range. The country is a dissected platform in which the flat-topped hills are the remnants of what were originally more extensive plains.

No. 74. Coalgate Folio. Indian Territory. Area 980 square miles, between the parallels 34° 30' and 35° and the meridians 96° and 96° 30'. The larger part of the quadrangle lies in the territory of the Choctaw Nation. The southern half is a nearly level plain, but the large streams of the northern half have deeper and narrower valleys. Mineral resources: coal, limestone, sandstone, and clay.

No. 75. Maynardville Folio. Tennessee. Area 963 square miles, between the parallels 36° and 36° 30' and meridians 83° 30' and 84°. The edge of the Cumber-